

ICONOGRAPHIA CYPERACEARUM II*

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As the second part of this series of illustrations the present paper presents ten species, which are: Carex doenitzii, C. curvicolis, C. mitrata, C. Breviscapa, C. jackiana (ssp.), C. brownii, C. olivacea (ssp.), C. idzuroei, C. michauxiana (ssp.), and Scirpus juncoides (ssp.). The selection of these species was made from the species that are endemic to the Japanese floristic region, or from those of which the main area of distribution lies in that particular floristic region.

It has been known among the cyperologists that the genus Carex shows its highest endemism in the Japanese floristic region. In 1962 I made a revision of Japanese Carices. In my revision of Japanese Carices (1962)** an emphasis was made on the taxonomic relationships of Japanese species with those of other floristic regions to elucidate the actual endemism of Japanese Carices. The following table reflecting the high endemism of Carex in the Far East was based on 422 species that I recognized to be valid in my above-mentioned study. The Japanese floristic region as regarded here includes the Japanese Archipelago from Kuriles to northern Ryukyus, Korea and the montane region of Formosa.

I would like to express my appreciation to Miss Josephine H. Ueno, who so ably typed my sometimes difficult manuscript in the form that suits the off-set printing.

* Part I. Phytologia 15 (3): 201-221, pls. 1-10. 1967.

** Koyama, T. Classification of the Family Cyperaceae (2). Journ. Fac. Sci. Univ. Tokyo, III, 8(4): 149-278. 1962.

Table 1. Geographical distribution of Carex occurring in the Japanese floristic region.

1.	Species endemic to the Japanese floristic region.....	59.3%
2.	Far Eastern species:	
2a.	Species extending to eastern Siberia and Manchuria.	16.3%
2b.	Species extending to Central China.	4.9%
3.	Discontinuous species:	
3a.	Species also occurring in Indian Himalayas, Southern China and occasionally as well as in Malaysia.	5.0%
3b.	Species also occurring in North America.	3.7%
3c.	Species also occurring in Australia and adjacent Malaysian Archipelago.	0.8%
4.	Wide species:	
4a.	Circum-polar and circum-boreal species.	6.5%
4b.	Eurasian species.	2.9%
4c.	Cosmopolitan species.	0.6%

Plate 11. CAREX DOENITZII Bockeler

Carex doenitzii Bockeler, Flora 65: 61. 1882.

Synonymy. Carex plocamostyla Maximowicz, Mém. Biol.
12:565. 1887.

Carex dicuspis Franchet, Bull. Soc. Philom. Paris 8^esér.
7: 42. 1895.

Carex chrysolepis Franchet & Savatier var. modesta Léveillé & Vaniot, Bull. Acad. Intern. Géogr. Bot. 10:
279. 1901

Carex dicraea C. B. Clarke, Kew Bull. Add. Ser. 8: 71.
1907.

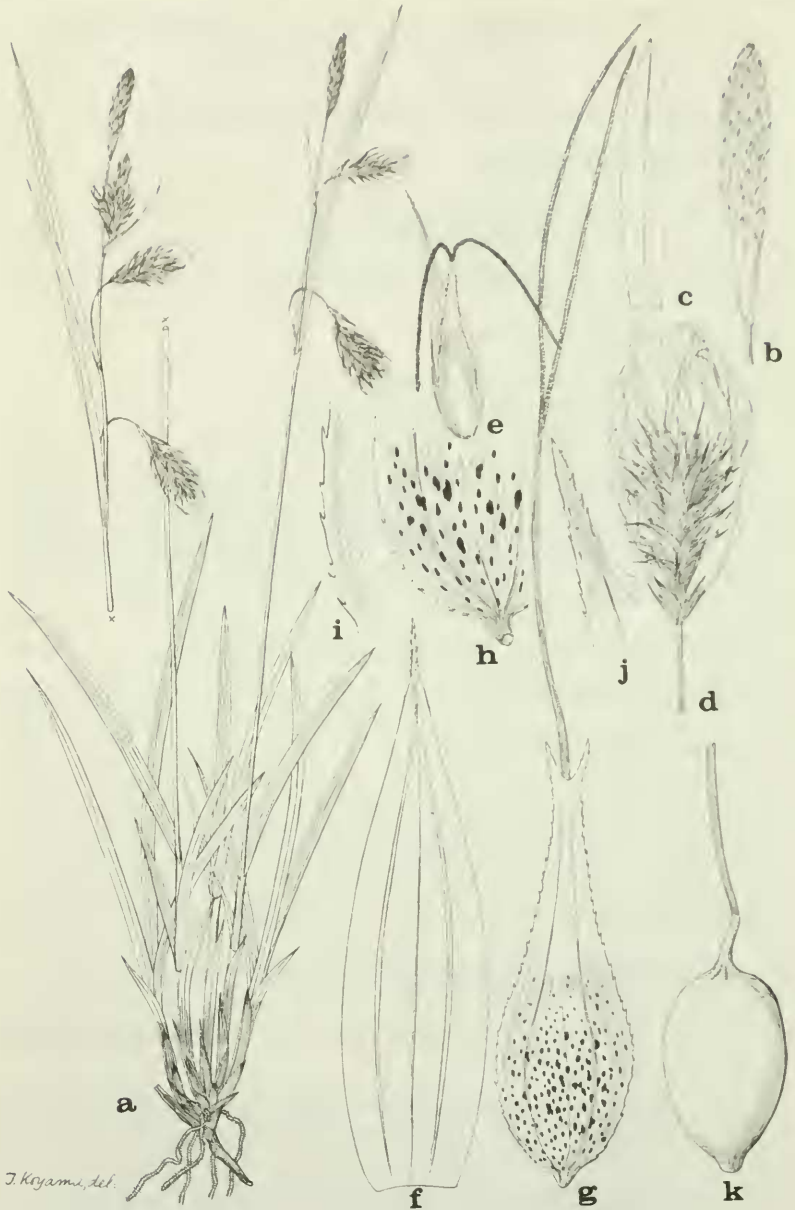


Plate 11. Carex doenitzii Bockeler

Carex nagatadakensis Masamune, Fl. Geobot. Stud. Yakushima, 526. 1934.

Carex doenitzii Bockeler var. mollis Akiyama, Journ. Jap. Bot. 13: 648. 1937.

Tufted in clumps; rhizome short, erect or erect-ascending, divided; roots densely yellow-hairy. Leaves radical, narrowly linear, shorter than to slightly longer than culms, linear, 3-5 mm wide, flat, rather soft, lightly green above, densely papillose and white-powdery beneath, gradually acute at apex; sheaths dorsally reddish- or purplish-brown, ventrally yellow-brown, the basal sheaths short-bladed or cataphylloid; ligule auriculate, membranous. Culms slender, 10-60 cm tall, ca. 1 mm thick, 3-sided, scaberulous, erect or slightly curved above. Spikes 2 to 4; upper 1 or 2 staminate, clavate, 0.7-2 cm long, 3-6 mm thick, deeply purple-brown; other spikes pistillate or rarely androgynous, obovate to elliptic, 1-3 cm long, 5-7 mm thick, densely many-flowered, cernuous or filiform peduncle, the lowest one often spaced and long-peduncled, the upper ones somewhat approximate and short-peduncled. Lower 1 or 2 bracts leaf-like equaling or slightly exceeding the inflorescence, not sheathing at base. Pistillate glumes lanceolate or ovate-lanceolate, 6-10 mm long, deeply purplish-fuscous, deeply red-purple or rarely greenish, gradually tapering above to an acute aristate apex; the awn scabrid 0.1-0.2 mm long, the costa green, 3-veined. Perigynia slightly shorter than glume, erect, lanceoblong or ovate-oblong, 4-6 (-10) mm long, unequally biconvex, membranous, lightly ferrugineous-green to yellowish-green, densely dotted with reddish purple, sparsely hispidulous on both sides, minutely serrulate on both margins, contracted at short-stipitate base, gradually tapering above to a long flattish beak, the orifice deeply bifurcate, the teeth shortly awn-shaped, serrulate. Achenes rather tightly enveloped, obovate-elliptic, biconvex, 2-2.2 mm long, contracted at both ends; style elongated, long-exserted beyond the orifice of perigynia; stigmas 2, filiform, up to 6 mm long, persistent.

Voucher specimen: Japan, Mt. Fuji, U. Faurie 15570 (KYO).

Wet open grassland or on rocks in subalpine regions. Distribution Endemic to Japan; from Hokkaido southwards to central Japan and southwestwards to Toyama Prefecture of Japan Sea side of the Mainland.

Plate 11. A. Total plant; B. Staminate spike; C. Staminate glume; D. Pistillate spike; E. Perigynium at anthesis; F. Staminate glume; G. Perigynium; H. Basal part of perigynium; I. Portion of the margin of perigynium; J. Tooth of the orifice of perigynium; K. Achene with style-base.

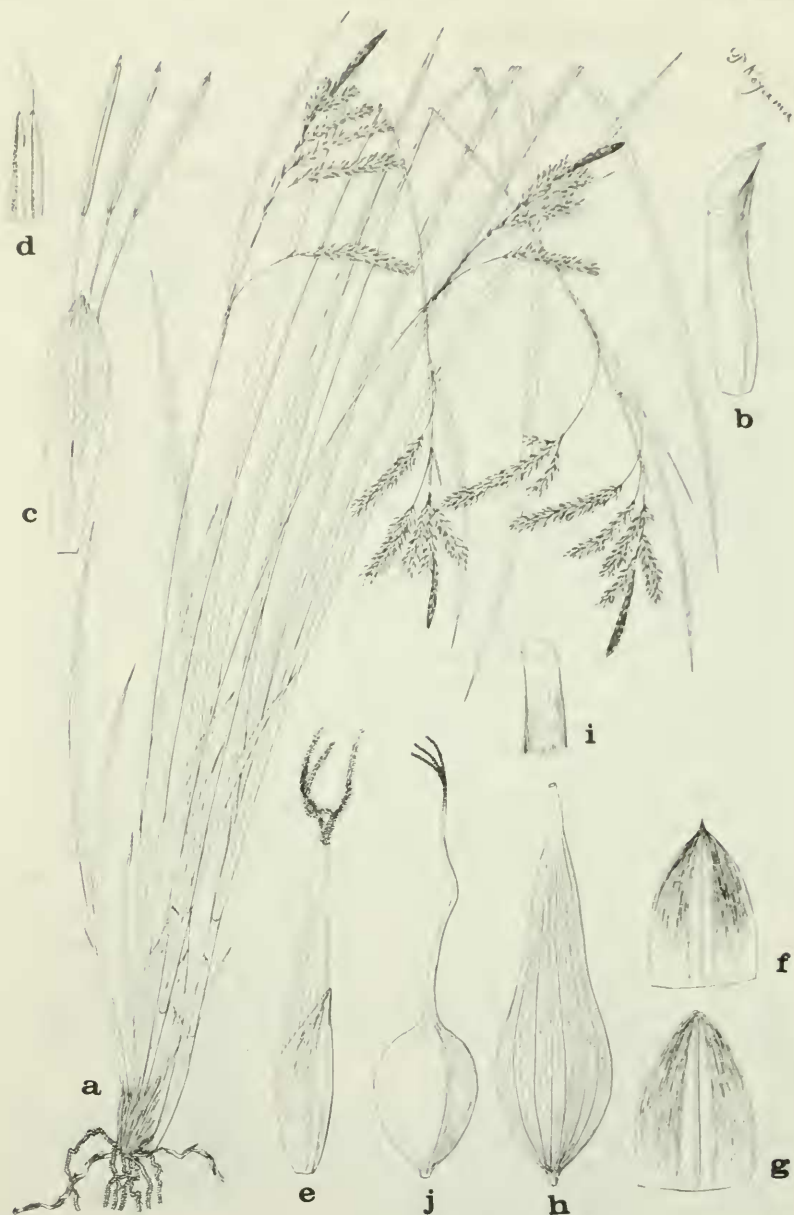


Plate 12. *Carex curvicollis* Franchet & Savatier

Plate 12. CAREX CURVICOLLIS Franchet & Savatier

Carex curvicolis Franchet & Savatier, Enum. Pl. Japon. 2: 579.
1879.

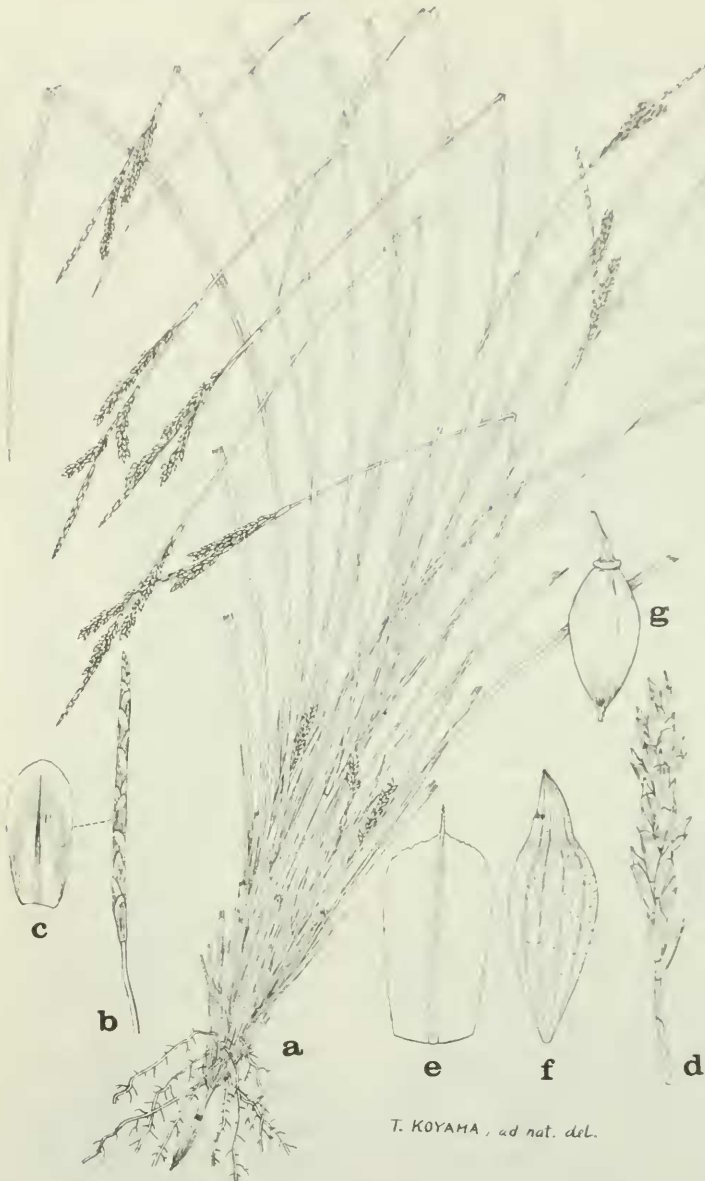
Synonymy. Carex viridula Franchet & Savatier, Enum. Pl.
Japon. 2: 2: 151 & 579. 1879. Not of Michaux, 1803.

Carex Savatieri Franchet, Nouv. Archiv. Muséum 3^e sér.
10: 71. 1898.

Densely tufted in large clumps; rhizome short, branching, stoloniferous; stolons slender, covered with reddish-brown scales, the inter-nodes 0.5-0.8 cm long; roots densely yellow-pubescent. Leaves many, narrowly linear, 2-4 mm wide, equalling or somewhat shorter than culms, flattish, soft, lightly green; sheaths pale-brown to reddish-fuscous, the basal ones short-bladed to cataphylloid, eventually split into soft brown fibers. Culms slender, acutely 3-angled, 10-35 cm long, soft, smoothish, inclined to nodding. Spikes 3-6 (-8), all approximate to subfastigate; terminal spike staminate, clavate, 0.8-2.5 cm long, 1.5-3 mm thick, purplish-fuscous, erect on a short peduncle or nearly sessile; lateral spikes pistillate, oblong to cylindrical, 1.5-4 cm long, 5-8 mm thick, densely many-flowered, the upper 3 or 4 subsessile or short-peduncled, the lower ones on a capillary elongated peduncle, the lowest spike sometimes with 1 or 2 additional spikes at the base of the body of the spike through branching. The lower 1 or 2 bracts leaf-like, equalling to slightly longer than inflorescence, the upper bracts glumaceous or setaceous, none sheathing at base. Pistillate glumes ovate, 1.5-2.25 mm long, deeply purplish-fuscous to pale-ferrugineous, contracted to obtusish or mucronulate apex, the costa green, obscurely 3-nerved. Perigynia much exceeding glumes, erect to erect-patent, lanceolate, 4-5 mm long, compressed trigonous, thinly membranous, pale-green, weakly and densely many-veined, smooth, glabrous, suddenly contracted at obtuse short-stipitate base, gradually tapering above to a long terete often slightly recurved beak, the orifice truncate or somewhat emarginate. Achenes loosely enveloped, elliptic-obovate, compressed-trigonous, 1.5-1.7 mm long, contracted at both ends; style elongated, slender, subsistent, not thickened at base; stigmas 3, 2.5 mm long, recurved.

Voucher specimen: Japan, Mainland, base of Mt. Bukosan in Saitama Prefecture, ca. 850 m alt., T. Koyama 6,703 (NY).

Plate 12. A. Total plant; B. Prophyll at the base of peduncle; C. Staminate glume and its triandrous flower; D. Apex of anther showing the connective; E. Perigynium at anthesis; F. G. Pistillate glumes; H. Dorsal view of perigynium; I. Orifice of perigynium; J. Fruiting pistil showing mature achene.



T. KOYAMA, ad nat. del.

Plate 13. Carex mitrata Franchet

Plate 13. CAREX MITRATA Franchet

Carex mitrata Franchet, Bull. Soc. Philom. Paris 8^e sér. 7:
88. 1895.

Tufted in large clumps with divided slender ascending rhizome. Leaves rather many, slenderly linear, stiffish, 1.5-2 mm wide, grass-green, folded, longer than culms, gradually attenuate to acute tip; sheaths yellow-brown or brown, eventually weakly split into brown parallel fibers. Culms many, slender but stiffish, 6-30 cm tall, obtusely trigonous, nearly smooth, glabrous. Spikes 3-5, the upper 3 or 4 approximate to contiguous at culm apex, the lowest one often basal; terminal spike staminate, linear, 5-15 mm long, 0.8-1 mm wide, whitish-brownish, short-peduncled to nearly sessile, slightly exceeding the next pistillate spike; lateral spikes pistillate, densely many-flowered, narrowly cylindrical to oblong, 0.5-1.5 mm long, 2-2.2 mm thick, green, erect, nearly sessile or on a short peduncle enclosed in bract sheath. Bracts short, setaceous or spatheaceous, much shorter than the subtending spike, the base hardly or short-(± 0.5 mm)-sheathing. Staminate glumes oblong, whitish-brownish, the margins broadly white-hyaline. Pistillate glumes oblong to oblong-obovate, 1.25-1.5 mm long, ca. 2/3 mm wide, membranous, pale, truncate at hyaline apex, the keel green, 1-nerved, projecting beyond the glume apex into a short upright mucro. Perigynia nearly erect, slightly longer than glume, fusiform-obovate to fusiform, 2-3 mm long, ca. 1-75 mm wide, 3-sided, membranous, lightly green, weakly many-veined, sparsely pubescent, the base gradually attenuate, the apex contracted to a short conical occasionally slightly incurved beak, the orifice minute, nearly entire. Achenes tightly enveloped, elliptic, triquetrous, 1.5 mm long, the sides shallowly concave below, the beak discoid-annulate, 0.25 mm wide; style thickened at base; stigmas 3, short, slender.

Voucher specimen: Japan, Mainland, Urawa in Saitama Prefecture, T. Koyama 6881 (NY).

Grassy hillsides somewhat sheltered by loose woods. Distribution. Endemic to Japan, central and western Mainland, Shikoku, Kyushu and southern Korea.

Plate 13. A. Total plant; B. Staminate spike; C. Staminate glume; D. Pistillate spike; E. Pistillate glume; F. Perigynia; G. Achene.

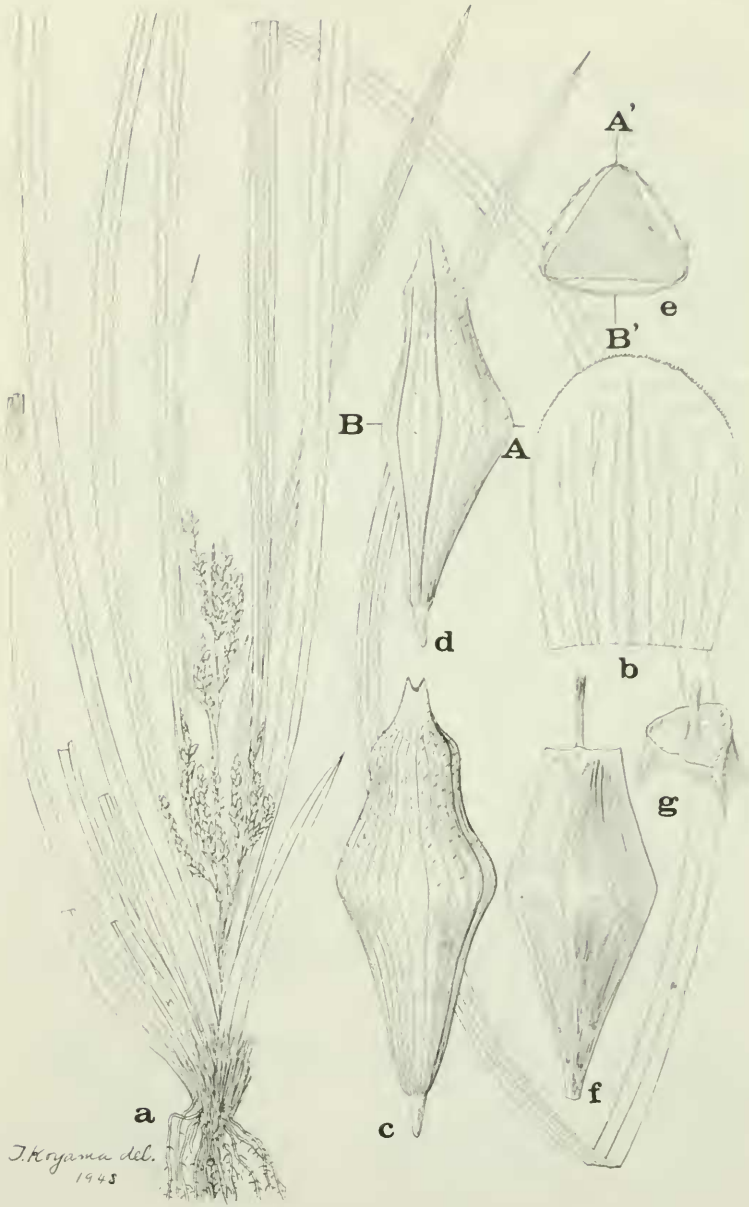


Plate 14. Carex breviscapa C. B. Clarke

Plate 14. CAREX BREVISCAPA C. B. Clarke

Carex breviscapa C. B. Clarke, Fl. Brit. Ind. 6: 736. 1894.

Synonymy. Carex jackiana Boott var. breviculmis Thwaites & Hook. f., Enum. Pl. Zeyl. 356. 1884.

Carex curtisii Ridley, Mater. Fl. Malay Penins. 3: 117. 1907.

[Carex obtuso-bracteata Hayata, Icon. Pl. Formos. 6: 131. 1916. Nomen nudum.]

Carex lutchuensis Ohwi, Mem. Coll. Sci. Kyoto Univ. B, 5: 270. 1940.

Densely tufted from short erect rhizome clothed with dark brown parallel fibers; roots rather stout. Leaves many, crowded, all radical, linear, elongated, 4-7 mm wide, 25-60 (-90) cm long, herbaceous, somewhat roughened above, 3-costate, flat-plicate, gradually tapering above to long acute apex, the base short-sheathing, dark purplish-brown on veins, eventually disintegrating into dusky-brown fibers. Culms much shorter than the leaves and almost hidden in leaf tussocks, 10-20 (-30) cm tall, slender, obtusely 3-angled, ca. 1 mm thick, 3- to 6-noded, bearing spikes from above the base. Spikes usually paniculate through branching; terminal spike staminate, slenderly linear, 1-2 cm long, 1 mm thick, pale-brownish, erect on a short peduncle, equalled or surpassed by the next lateral spike; lateral spikes pistillate or with short staminate part at apex, narrowly cylindrical, erect to erect-patent, 1-3 cm long, 3-4 mm thick, loosely many-flowered, the upper spikes short-peduncled or nearly sessile, the lower ones on exerted peduncles. The lower 2 or 3 leaf-like bracts elongated, much exceeding the inflorescence, reaching 40 cm in length; upper bracts much reduced, short-bladed or spathaceous, the sheathing base 1-2.5 cm long. Pistillate glumes elliptic-oblong or ovate-oblong, 2-3 mm long, 1-1.75 mm wide, membranous, pale- or whitish-brown, white on hyaline margins, obtuse or rounded at cilio-late apex, faintly several-nerved on both sides, the midvein greenish ending below the glume apex or projecting beyond the glume apex into a short straight mucro 1/2 to 1 mm long. Perigynia about twice as long as glumes, rhombic-lageniform, 3-sided, 3.75-5 mm long, broadest at about the middle, 1.25-1.5 mm wide, membranous, pale-green, glabrescent or sparsely puberulent on the upper half, slenderly many-nerved, cuneate at short-stiped base, contracted above to a short conical beak 1/2 to 1 mm long, the orifice 2-toothed. Achens tightly enveloped, rhombic-fusiform, 2.5-3 mm long, triquestrous, 1.25-1.5 mm wide, cuneate at base, gradually narrowed above the middle to transversely truncate apex with annulate margin ca. 1 mm in diameter; style short,

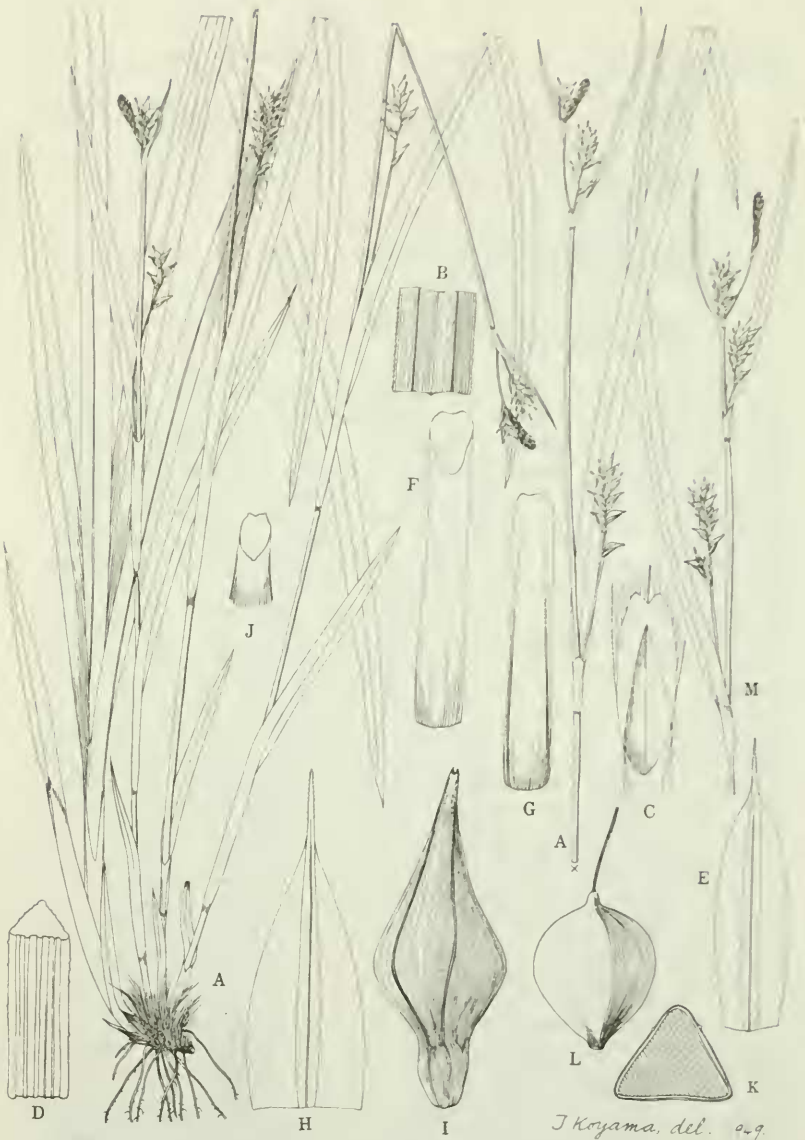


Plate 15. *Carex jackiana* Boott
subsp. *parciflora* Kükenthal

often with thickened base; stigmas 3.

Voucher specimen: Formosa, Taipei-hsien, Shirin, Ohwi Hb.
TNS 55,925 (TNS).

Undergrowth of dense forest in the tropical high mountain zone and on hills in the subtropics. Distribution. From Ceylon through Malaysia eastwards to northern Queensland of Australia, and northeastwards to Annam, Formosa and the Ryukyu Islands.

This species is recognizable at once by the slender short culms hidden in the well-elongated leaf blades as well as in the peculiar lageniform perigynia.

Plate 14. A. Total plant; B. Pistillate glume; C. Dorsal view of perigynium; D. Lateral view of perigynium; E. Transverse section of perigynium at the level marked A - B in Fig. D; F. Dorsal view of achene; G. Annulate apex of achene.

Plate 15. *CAREX JACKIANA* Boott subsp. *PARCIFLORA* Kükenthal

Carex jackiana Boott subsp. parciflora (Boott) Kükenthal,
Pflanzeru. 4(20), Cyper-Caric. 638. 1909. Incl.
forma ochrolepis (Franchet) Kükenthal.

Synonymy. Carex parciflora Boott, Mem. Amer. Acad.
N.S. 6: 418. 1859.

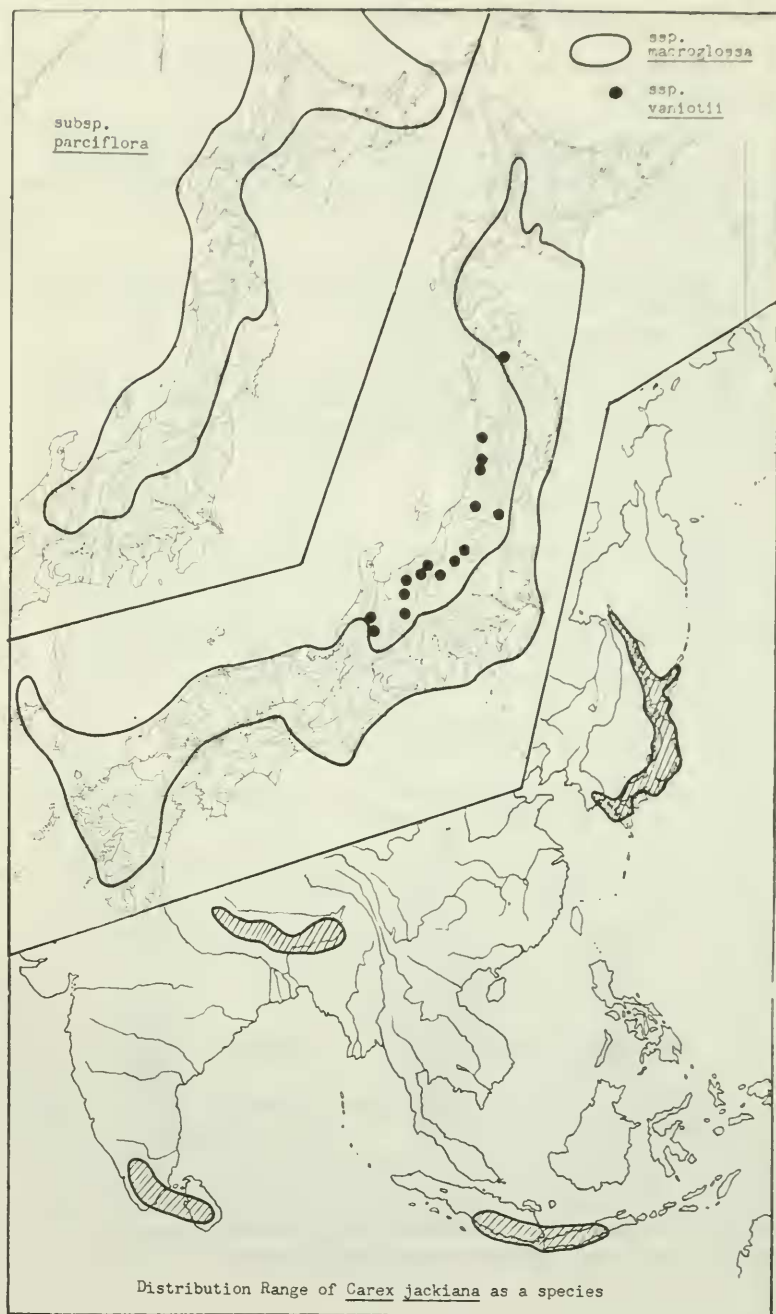
Carex ochrolepis Franchet, Nouv. Archiv. Muséum, 3^e sér.
10: 48, t.2, f.2. 1898.

Carex jackiana Boott var. parciflora (Boott) Kükenthal
ex Matsumura, Index Pl. Japon. 2(1): 115. 1905.

Carex kamikochiana Nakai [Rep. Veg. Kamikochi 34 & 42.
1928. Nomen nudum] ex Akiyama, Journ. Fac. Sci.
Hokkaido Univ. 5, 2: 163. 1932.

Carex parciflora Boott forma ochrolepis (Franchet)
Miyabe & Kudo, Fl. Hokkaido & Saghal. 2: 267. 1931.

Loosely tufted; rhizome decumbent, short or slightly elongated, covered with brown fibers. Leaves basal and 1 or 2 upper on the lower part of culms, linear or broadly linear, 5-10 mm wide, shorter than culms, soft, 3-costate, flattish-plicate, whitish-green, sheaths pale-green or pale, elongated, ventrally thinly membranous, the ligule shortly produced, rounded, white-hyaline, the basal sheaths short-bladed, brownish to fuscous,



eventually more or less split into soft brown fibers. Culms erect, acutely 3-angled, 50-80 cm tall, smooth, whitish-green. Spikes (3-) 4 or 5, the upper 2 or 3 approximate and nearly sessile or on short peduncle, the lower 2 or 1 much spaced and on long-exserted peduncle; terminal spike staminate, clavate, 1-1.7 cm long, ca. 1.3 mm thick, pale or becoming stramineous later, nearly sessile and fastigate with the next pistillate spike, or short-peduncled (forma ochrolepis Klukenthal); lateral spikes pistillate, elliptic to oblong, subdensely flowered or in the lower spikes loosely flowered toward the base of spike, 1.5-3 cm long, 5-7 mm thick, whitish-green. Leaf-like bracts about 3, slightly overtopping the inflorescence, the upper 1 or 2 hardly or only shortly sheathing, the lower ones long-sheathing. Pistillate glumes ovate or broadly ovate, 3-4 mm long, 1.7-2 mm wide, membranous, pale or pale-green on both sides, the apex acute or obtusish, mucrovate or cuspidate, the costa obscurely 3-nerved, green. Perigynia slightly longer than glume, ovoid or ovoid-ellipsoid, 4-5.5 mm long, 1.5-1.75 mm wide, 3-sided, membranous, whitish-green, finely many-veined, contracted at spongy-stipitate base, tapering above to an erect or somewhat curved beak, the orifice obliquely truncate with white hyaline margin. Achenes tightly enveloped, obovate or broadly so, triquetrons 2.2 mm long, 1.7-2 mm wide, contracted at both ends; style slender elongated, not thickened at base; stigmas 3.

Voucher specimen: Japan, Hokkaido, Hamatombetsu in Kitami Province, T. Koyama 11,080 (NY).

Moderately wet grassy places mostly as the undergrowth of forest at the Fagus belt. Distribution. Saghalien, southern Kuriles, Hokkaido, Japan Mainland from North-eastern District and the Japan Sea side of Central District.

Subspecies parciflora is the Far Eastern counterpart of Indo-Malasian Carex jackiana subsp. jackiana. It differs from the latter chiefly in its smaller perigynia and shorter pistillate glumes. Subspecies parciflora tends to form looser tufts due to its decumbent rhizome.

Plate 15. A. Total plant; B. Portion of leaf blade; C. Ligule; D. Portion of culm; E. Staminate glume; F, G. Two views of prophyll; H. Pistillate glume; I. Perigynium; J. Orifice of perigynium; K. Transverse section of perigynium; L. Achene.

Plate 16. CAREX BROWNII Tuckerman

Carex brownii Tuckerman, Enum. Meth. Caric. 21. 1843.

Synonymy. Carex brownii Tuckerman var. viridis

Böckeler, *Linnaea* 41: 151. 1877.

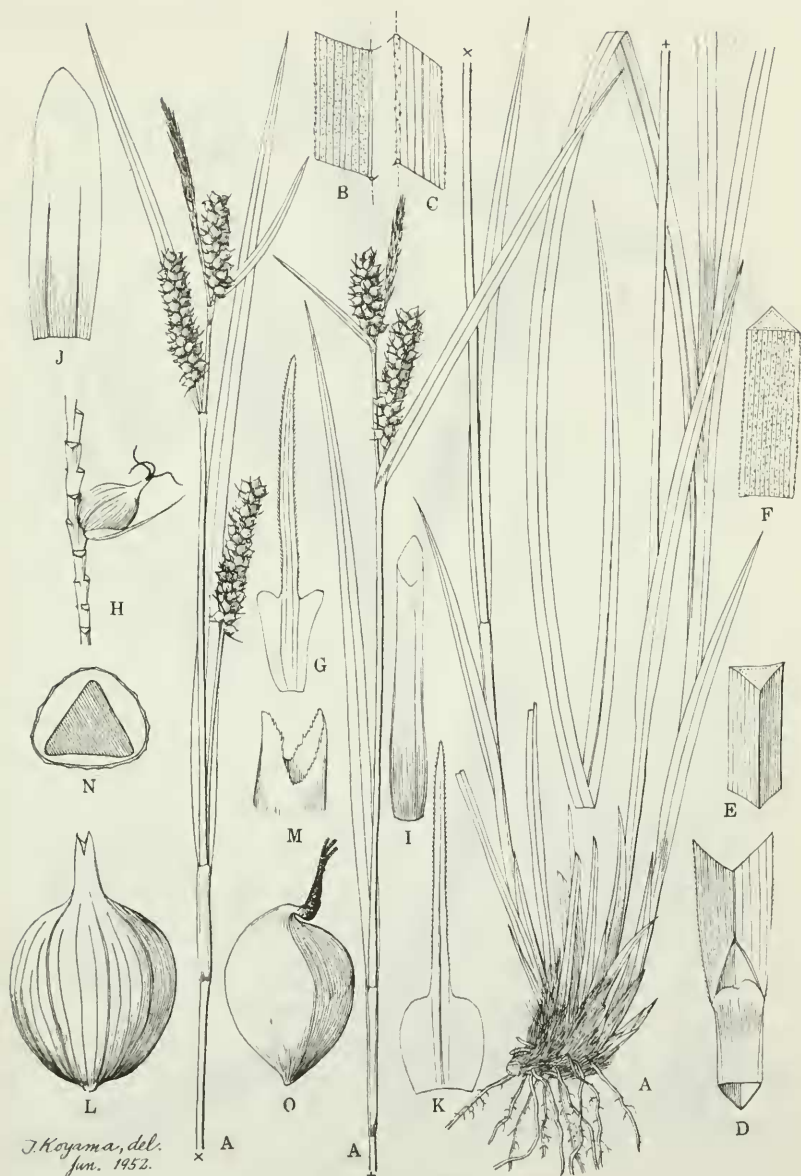
Carex nipposinica Ohwi, *Act. Phytotax. Geobot.* 11: 255.
1942.

Loosely tufted from decumbent or short-creeping rhizome. Leaves rather loose, basal and subbasal, sometimes the upper 1 or 2 on the lower part of culms, linear, shorter than or equalling culms, 3-5 mm wide, weakly folded, stiffly herbaceous, grass-green above, pale-green beneath, scabrid, gradually attenuate to acute apex, long-sheathing at base; sheaths ventrally white-membranous, dorsally greenish, the basal sheaths short-bladed and tinged with light brown, eventually split into brown or dark brown parallel fibers. Culms rigid, erect, acutely to obscurely trigonous, 27-80 cm tall, 1-1.75 mm thick, striate, smooth and 1- or 2-noded toward the base, scaberulous above the middle. Spikes 3 or 4 (occasionally 5); terminal spike staminate, linear-cylindrical, erect on short peduncle, 1-3 cm long, ca. 2 mm thick, pale green; lateral spikes pistillate, erect, two upper approximate or contiguous, the lowest spaced, cylindrical, 1.5-3 cm long, 5-6 mm thick, densely many-flowered, grass-green (but, olivaceous when dried), the uppermost one nearly sessile or on a very short peduncle, others on a peduncle increasingly exerted from bract-sheath downward. Bracts leaf-like, longer than subtending spike, usually slightly overtopping the inflorescence, shortly to longly sheathing. Pistillate glumes ovate or elliptic, 1-2 mm long excluding awn, 1-1.5 mm wide, thinly membranous, whitish, the green keel excurrent into a flat long scabrous awn 0.5-4 mm long. Perigynia ellipsoid, ellipsoid-obovoid or subglobose, much inflated, 3.5-4.5 mm long, 1.5-2.25 mm wide, thickly membranous, distinctly many-veined, glabrous, patent when mature, green and olivaceous when dried, abruptly contracted at non-stipitate base, abruptly contracted at apex with a short subterete beak 0.5-1 mm long, the orifice hyaline, obliquely truncate or 2-toothed. Achene loosely enveloped, obovate-elliptic or elliptic, 3-sided, 2.25-2.5 mm long, 1.5 mm wide, the faces somewhat concave, contracted at both ends, the apex with a short bent beak; style slightly thickened at base; stigmas 3, short.

Voucher specimen: Japan, Mainland, Boso Peninsula, Torami, T. Koyama 11,052 (NY).

Sporadically occurring in wet grasslands. Distribution. Japan, New Guinea, Australia and New Zealand.

Plate 16. A. Total plant; B. Portion of leaf blade showing the upper surface; C. Portion of leaf blade showing the lower surface; D. Orifice of leaf sheath; E. Lower part of culm; F. Upper part of culm; G. Staminate glume; H. Rhachilla of spike with a pistillate floral unit; I. Prophyll at the base of peduncle of spike; J. Dissected prophyll; K. Pistillate glume; L.

Plate 16. *Carex brownii* Tuckerman



T. KOYAMA, DEL.

Plate 17. *Carex olivacea* Boottsubsp. *confertiflora* T. Koyama

Perigynium; M. Orifice of perigynium; N. Transverse section of perigynium; O. Achene.

Plate 17. CAREX OLIVACEA Boott subsp. CONFERTIFLORA T. Koyama

Carex olivacea Boott subsp. confertiflora (Boott) T. Koyama,
Bot. Mag. Tokyo 72: 307. 1959.

Synonymy. Carex confertiflora Boott ex A. Gray, Mem.
Amer. Acad. N.S. 6: 418 (= Bot. of Japan 418). 1859.

Carex olivacea Boott var. angustior Kükenthal, Pflanz.
zenr. 4(20), Cyper-Caric. 618. 1909.

Rhizome robust, horizontally long-creeping, stoloniferous. Shoots solitary or few together at nodes or rhizome. Leaves basal and few (1 or 2) upper on culms, broadly linear, 8-15 mm wide, shorter than to exceeding the inflorescence, rather thickly herbaceous, soft, conduplicate with 3 conspicuous costas, grass-green above, white-powdery beneath, acute at apex, long-sheathing at base; basal sheaths short-bladed or cataphylloid, brown to rusty-brown, hardly or loosely split into brown fibers. Spikes 3 to 7, terminal one staminate, linear, 3-7 cm long, ca. 2 mm thick, yellowish-brownish, erect on short peduncle; all lateral spikes pistillate or occasionally the uppermost lateral spike staminate or androgynous, the pistillate ones cylindrical, 2.5-7 cm long, 7-9 mm thick, densely many-flowered, green and becoming olivaceous when dried, erect on short rather stout peduncle. Bracts 4-6 leaf-like, 1 or 2 upper setaceous, the leaf-like bracts erect-patent, exceeding inflorescence, short-sheathing at base. Pistillate glumes oblong-elliptic, ca. 2.5 mm long, membranous, pale-white, spotted with brown, acute obtusish or sometimes shallowly emarginate at apex, the costa green, 3-nerved, excurrent beyond the glume apex into a straight scabrous awn 0.5-2 mm long. Perigynia broadly elliptic or obovate-elliptic, longer than subtending glume, 3.75-4 mm long, patulous to spreading, rounded at non-stipitate base, herbeaceous, pale- or cinereous-green and becoming dark olivaceous when dry, many-veined, contracted to a short erect or recurved beak 0.8-1 mm long, the orifice hyaline, obliquely truncate with minute teeth. Achenes loosely enveloped, broadly obovate or broadly elliptic, 2 mm long, trigonous, short-beaked at apex; style thickish, hardly enlarged at base; stigmas 3.

Voucher specimen: Japan, Mainland, along Katashina River ca. 8 km south of Lake Ozenuma in Gumma Prefecture, 1,000 m alt., T. Koyama, s.n., 3 Aug. 1949 (NY).



Plate 18. Carex idzuroei Franchet & Savatier

Forming large colonies in shallow water of lake margins or narrow rivers. Distribution. Endemic to Japan (Hokkaido and the mainland). As a species Carex olivacea is distributed in the Indian Himalayas, Java, Lower Yanzgtze River Valley of Central China, and Japan.

Subspecies confertiflora is the Japanese counterpart of Carex olivacea subsp. olivacea of Indian Himalayas and Java. The taxonomic differentiation and phytogeographical relationships between the two subspecies were fully discussed in my previous publication (T. Koyama, Bot. Mag. Tokyo 72: 298-308. 1959).

Plate 17. A. Total plant; B, C. Two views of prophyll at the base of peduncle; D. Staminate glume; E. Pistillate glume; F, G. Dorsal and lateral views of perigynium; H. Orifice of perigynium; I. Achene; J. Achene further enlargement of achene.

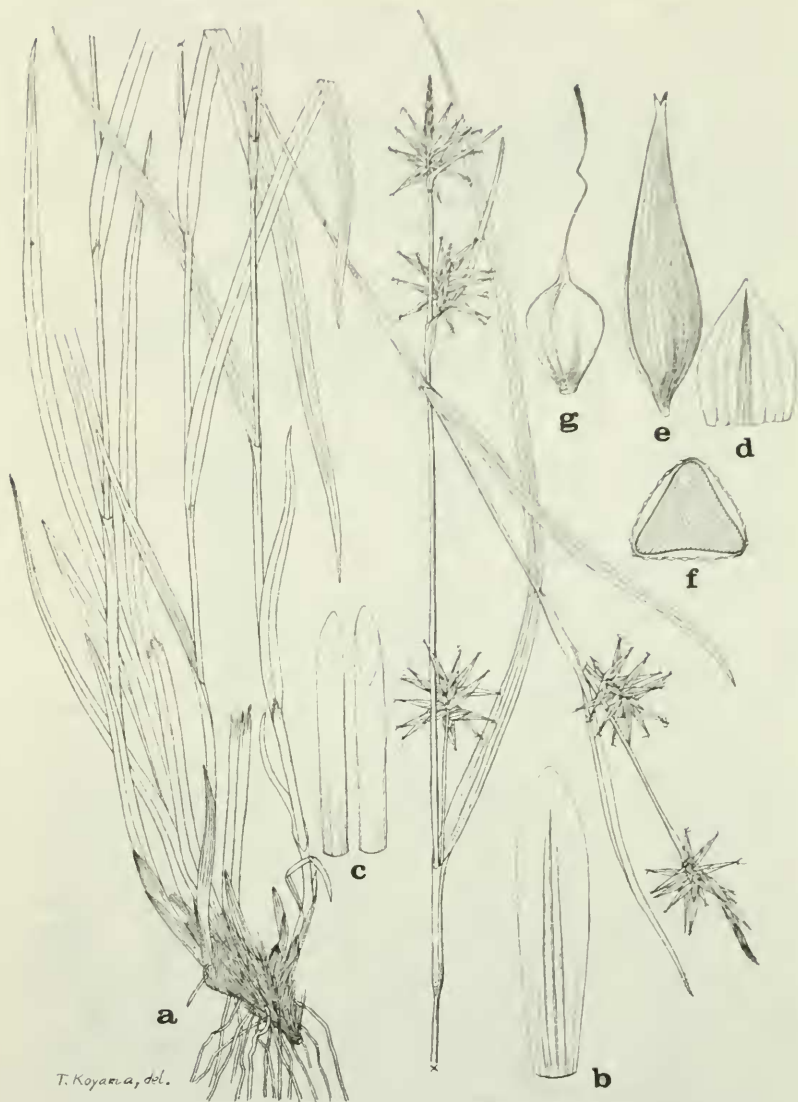
Plate 18. CAREX IDZUROEI Franchet & Savatier

Carex idzuroei Franchet & Savatier, Enum. Pl. Japon. 2: 155 & 583. 1879.

Synonymy. Carex pseudo-vesicaria Léveillé & Vaniot, Bull. Acad. Intern. Géogr. Bot. 11: 180. 1902.

[Carex multinervia Kükenthal ex C. B. Clarke, Journ. Linn. Soc. 36: 298. 1904. Invalid name in synonymy.]

Subloosely tufted in small clumps; rhizome stoloniferous; stolons slender, ca. 1.5 mm thick, clothed with lightly brown scales. Leaves basal and subbasal, 1 or 2 upper on the culm, linear, flattish, 3-9 mm wide, usually shorter than culms, soft but somewhat thickish, lightly green, obscurely septate-nodulose, gradually acute at apex, long-sheathing at base; basal sheaths bladed, pale-brownish tinged with red-brown, not conspicuously disintegrating into fibers. Culms 20-60 cm tall, trigonous, smoothish. Spikes 3-5; terminal spike staminate, occasionally with a short sessile additional staminate spike immediately below the body of spike, linear, 2-5 cm long, 1.5-2 mm thick, pale-greenish, erect on long peduncle; lateral spikes pistillate or the upper ones with a short staminate portion at apex, ellipsoid or oblong, 1.5-4 cm long, 7-10 mm thick, subdensely many-flowered, lightly green and becoming olivaceous when dry, erect-patent, nearly sessile, or the lowest one on a short or slightly exserted peduncle. Bracts 2-4, leaf-like, the lowest equalling or slightly overtopping the inflorescence, hardly to short-sheathing at base, the upper ones shorter than the inflorescence, non-sheathing at base. Pistillate glumes ovate

Plate 19. *Carex michauxiana* Bockelersubsp. *asiatica* Hultén

or deltoid ovate, 4.5-5.25 mm long, membranous, pale or tinged with straw-colored on both sides, narrowed from above the base to briefly acutish mucicous apex, the costa broadly green, indistinctly 3-nerved. Perigynia about twice as long as the subtending glume, ovate-elliptic, 10-12 mm long, erect-patent, subcoriaceous, strongly swollen, finely many-veined, glabrous, abruptly rounded-contracted at short-stipitate base, tapering above to a long slender hispidulous beak, the orifice white-membranous, 2-toothed, the teeth acute. Achenes loosely enveloped, rhombic-elliptic, 2.75-3 mm long, acutely triquetrous; style rigid, persistent, not thickened at base; stigmas 3.

Voucher specimen: Japan, Mainland, Tajimagahara Swamp along Arakawa River in Saitama Prefecture, ca. 50 m alt., T. Koyama, s.n., 27 May, 1951 (NY).

Sporadically occurring in lowland swamps. Distribution. Japan (the Mainland, Shikoku, Kyushu) and China (Yangtze River Valley).

Plate 18. A. Total plant; B. Staminate glume; C. Perigynium; D. Achene.

Plate 19. *CAREX MICHAUXIANA* Böckeler subsp. *ASIATICA* Hultén

Carex michauxiana Böckeler subsp. asiatica Hultén, Fl. Kamtsch. 1: 207. 1927.

Synonymy. *Carex michauxiana* Böckeler forma *asiatica* (Hultén) Akiyama, Journ. Fac. Sci. Hokkaido Univ. 5, 2: 220. 1932.

Carex dolichocarpa C. A. Meyer ex V. Krecz., Fl. URSS. 3: 458 & 623. 1935.

Carex michauxiana Böckeler var. asiatica (Hultén) Ohwi, Mem. Coll. Sci. Kyoto Univ. B, 11: 491. 1936.

Carex michauxiana of many authors not of Böckeler.

Subloosely tufted in small or large clumps; rhizome stout, obliquely ascending, divided, clothed with grayish-brown fibers. Leaves few to a culm, 1 or 2 basal and 1 to 3 upper on culms, all spaced, linear, 3-5 mm wide, 8-25 cm long, stiffish, thin, lightly green, 3-costate, weakly folded, acute at apex, the sheathing base 2-6 cm long, pale; basal sheaths cataphylloid or short-bladed, brown, eventually disintegrating into parallel fibers. Culms slender, 20-50 cm tall, 0.8-1 mm thick, obtusely trigonous, smoothish or scaberulous below inflorescence. Spikes

3-5, the uppermost 2 approximate, remainder spaced; terminal spike staminate, linear, 0.7-1.5 cm long, 1-1.2 mm thick, pale-green, erect on very short peduncle, slightly exceeding or surpassed by the pistillate spike immediate below it; lateral spikes pistillate, subglobose at maturity with spreading perigynia, 1-1.7 cm long and as wide, subloosely flowered, yellowish-green, the upper ones on short inclosed peduncle, the lowest on a long exerted peduncle. Bracts 2 or 3 leaf-like, shorter than to slightly overtopping inflorescence, short- or in the lowest long-sheathing at base. Pistillate glumes ovate or broadly ovate, 4-5 mm long, pale-green or lightly yellow-brown, acutish or obtusish at apex, the costa broadly green, sub-5-nerved, ending below the hyaline apex of glume. Perigynia spreading or divergent at maturity, lanceolate or lance-oblong, 9-13 mm long, obtusely trigonous, coriaceous, yellowish green, finely many-veined, glabrous, suddenly contracted at slightly spongy base, gradually attenuate above to a long erect beak, smoothish or hispidulous on upper margins, the orifice distinctly bi-lobed with erect rigid teeth. Achenes rather tightly inclosed, obovate, trigonous, 2.3-2.5 mm long, contracted at both ends; style elongated, rigid, slightly thickened at base forming a mucro at achene apex; stigmas 3, ca. 3 mm long.

Voucher specimen: Japan, Mainland, Ozegahara Moor in Nikko National Park, 1,600 m alt., T. Koyama, s.n., July 21, 1950 (NY).

Wet peaty sedge swamp or in the Sphagnum moor at upper temperate zone. Distribution. From the Mainland of Japan (the Japan Sea Side of Central District, upper Kwanto District and Northeast District), Hokkaido, northward to Saghalien, and northeastwards to Kuriles and Kamtschatka.

Carex michauxiana, as a species, shows the distribution of American-Japanese floristic link. Since subspecies michauxiana occurs in eastern North America, Aleutian Islands, Alaska and western Canada are the interferent regions between the two disjunct areas. Morphologically Asiatic subsp. asiatica differs from subsp. michauxiana by more robust habit, larger perigynia and relatively shorter bracts. In subsp. asiatica the pistillate glumes are about 2/5 the length of the subtending perigynium, while in subsp. michauxiana they are less than 1/3 the length of the perigynia.

Plate 19. A. Total plant; B. Staminate glume; C. Two views of prophyll at the base of peduncle of spike; D. Pistillate glume; E. Perigynium; F. Transverse section of perigynium; G. Achene with persistent style.

Plate 20. SCIRPUS JUNCOIDES Roxb. subsp. HOTARUI T. Koyama

Scirpus juncoides Roxburgh subsp. hotarui (Ohwi) T. Koyama,
stat. nov.

Basionym. Scirpus hotarui Ohwi, Repert. Sp. Nov.,
Fedde, 36: 44. 1934.

Synonymy. Scirpus juncoides Roxburgh var. hotarui (Ohwi)
Ohwi, Mem. Coll. Sci. Kyoto Univ. B, 18: 114. 1944.

Scirpus erectus of many authors, not of Poiret.

Annual, tufted in dense clump without distinct rhizome; roots fibrous, soft, light brownish. Culms erect, slender to very slender, 13-40 cm tall, 0.7-1 mm thick, deeply green, quite smooth, terete or very finely striate when dry, clothed at base with 2 or 3 bladeless sheaths. Sheaths the longest up to 6 cm long, the shorter 5 to 20 mm long, pale-green, ventrally white-membranous, the orifice obliquely truncate, acute, sometimes with a sublate elongation of green dorsal portion up to 1 mm long; basal sheaths cataphyllous or scale-like, brownish. Inflorescence of 1 to 3 sessile spikelets in pseudo-lateral head. Lowest involucre bract upright, continuing to the culm, culm-like, 3-7 cm long, terete, 1-furrowed ventrally, acutish at apex, the base dilated with membranous margins. Second and third bracts when exist broadly oval, membranous, the midrib excurrent into a subulate projection 0.2-5 mm long. Spikelets ovoid to ovoid-globose, terete, 6-14 mm long, 4-6 mm across, acutish to rather rounded at apex, greenish and straw-colored later. Glumes broadly ovate to oval, or almost orbicular, boat-shaped, 2.8-4.5 mm long, 3-4.8 mm wide, membranous to papyraceous, pale and densely brown-lineolate on both sides, the costa broadly green, 3-nerved above, forming a minute mucro at rounded or shallowly emarginate apex of glume. Achenes broadly obovate, slightly adpressed-triangular with flat or shallowly concave sides, (1.8-) 2-2.5 mm long, 1.7-2 mm wide, contracted at base, rounded to mucronate apex, the sides punctate and distinctly transversely wrinkled, blackish-brown when mature. Hypogynous bristles 6, needle-like, lightly yellowish-brown, retrorsely scabrous, the longer (2 or 3) slightly longer than achene, remainder 2/3 to 3/4 the length of achene; style caducous, slightly thickened above the middle, glabrous; stigmas 3-cleft, recurved. Anthers 1 mm long, the connective oblong.

Voucher specimen: Japan, Mainland, Boso Peninsula, swamp near Yatsumi, sea level, T. Koyama 5,000 (NY).

Wet places of varying conditions such as rice fields, wet meadows, wet sand, from warm region to upper temperate zone. Distribution. Japan (Hokkaido to Kyushu), Korea, Manchuria,

T. Koyamae Int. 38

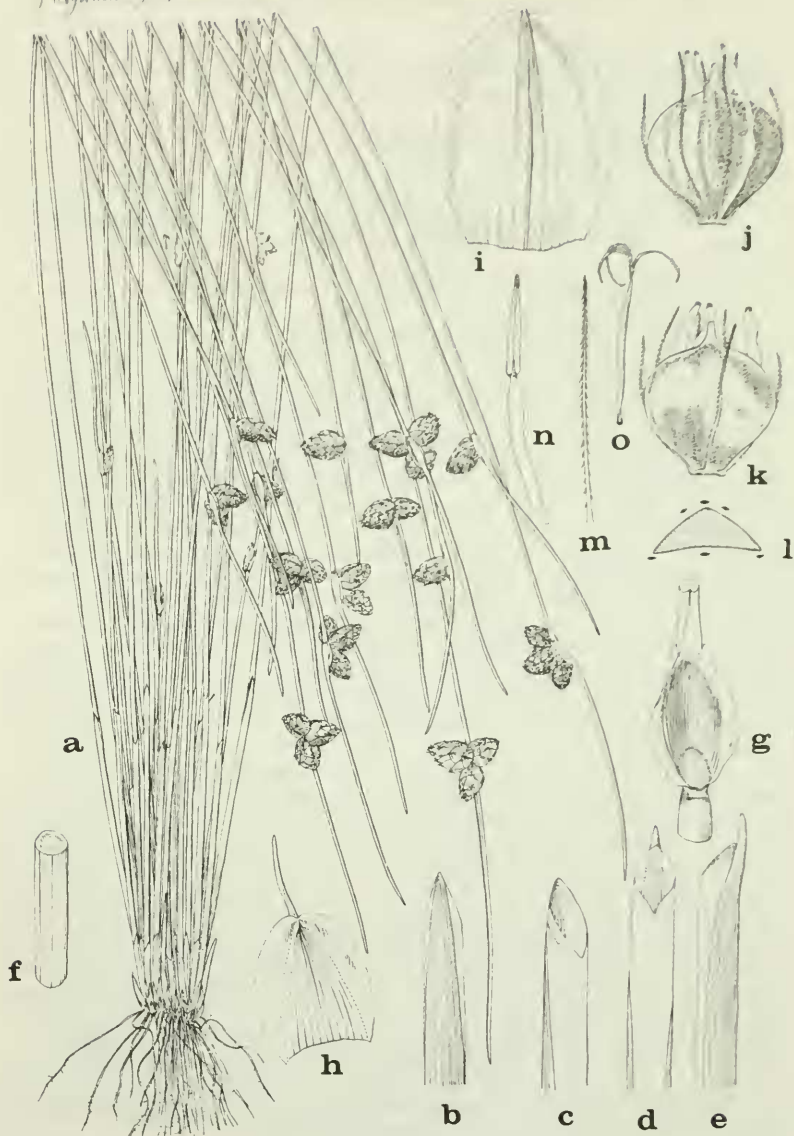


Plate 20. *Scirpus juncoides* Roxburgh

subsp. *hotarui* T. Koyama

and the northern Ryukyu Islands.

Plate 20. A. Total plant; B & C. Dorsal and ventral views of the upper part of sheath without notch; D & E. ventral and lateral views of the upper part of sheath with a notch; F. Portion of culm; G. Basal part of lowest involucre bract; H. Second bract; I. Glume; J & K. Dorsal and ventral views of mature achene with hypogynous bristles and withered filaments; L. Transverse section of achene; M. Hypogynous bristle; N. Stamen; O. Style and stigmas.